

US EPA ARCHIVE DOCUMENT

Sampling Plan for Local Limits Development

The sampling plan should address four issues which are discussed in more detail below, including: (1) the pollutants to be evaluated; (2) the points of sampling to determine removal rates and background loadings; (3) the number and type of sampling events; and (4) the analytical methods to be used and the levels of detection.

1. Pollutants to be Evaluated

EPA's local limits guidance lists fifteen pollutants that should always be included in the local limits evaluation. The "standard ten" parameters should be examined, which include **arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, silver and zinc. Molybdenum and selenium** should be examined due to their inclusion in EPA's sludge quality program and the availability of sludge quality-based criteria. The General Pretreatment Regulations include increasing the opportunity to recycle and reclaim municipal sludges (land application) as one of its goals, and therefore POTWs should develop their pretreatment programs to allow for land application even if this is not currently the chosen sludge disposal method. In addition, **BOD, TSS, and ammonia** should be evaluated. BOD and TSS are the pollutants that have been found to most frequently cause pass through and interference. POTWs should not allow industrial discharges that could result in influent levels exceeding the treatment plant design loadings for these pollutants. Ammonia has often been found to cause toxicity in POTW effluents, but can be eliminated from the list of pollutants if there are no industrial users discharging ammonia above background levels. The list of pollutants to be evaluated should include justification if the POTW is proposing not to include ammonia in the headworks analysis. Although the POTW may not end up adopting a limit for each of these 15 parameters, they should all be included in the headworks analysis and examined to see if the need for a limit exists.

There may also be parameters which are not included above, but for which the POTW has an existing local limit, which appear in the POTW's permit, have shown up in significant amounts at the POTW, are known to have caused problems in the past, or are indicated as problem pollutants in a TMDL or other State 303(d) listing of impaired waterways for the POTW's receiving stream. Review of past POTW influent and sludge priority pollutant scans can be used to help identify pollutants present in significant quantities. Any of these site-specific parameters should also be included in the evaluation.

2. Sampling Points

To an extent, this will depend on the design of the POTW and the type of treatment units that are present. However, the main points are: **raw influent, influent to secondary treatment, influent to tertiary treatment (if tertiary treatment present), influent to digester (if anaerobic), final effluent, sludge, background/unregulated, and hauled waste (if received).**

The most important sample points are the influent, effluent, background/unregulated, and hauled waste because this data has the most impact on the final limits. It is important to ensure that enough data exists for these four sample points, and if necessary, sampling at the influent to the secondary and tertiary treatment units can be reduced or eliminated.

The influent and effluent samples are used to get overall removal rates for the plant. The primary and secondary sample points get internal removal rates for use in the inhibition-based limits. In general, sampling should be conducted at the influent to any treatment unit for which inhibition calculations will be done to develop a site specific removal rate. Removal rates are a critical piece of data and can have a significant impact on the final local limits.

The digester influent need only be sampled for non-conservative parameters for which an inhibition criteria is available (such as cyanide), to account for alteration or loss of the non-conservative pollutant levels through the plant. For conservative pollutants, the overall removal rate is used, and so no digester sampling is required. Sampling is specified for anaerobic digestion only, as there are no inhibition criteria for aerobic digesters in the EPA guidance. If the POTW has site specific inhibition criteria available, it should conduct sampling for those pollutants as well.

The sludge sampling can be useful in generating a mass balance, so that the POTW may check that pollutant levels are being properly accounted for or assumed. It can also be used to generate overall removal rates which can then be checked against the influent/effluent-generated rates, or used when effluent detection levels prevent the calculation of adequate influent/effluent generated removals.

The background, or unregulated, sample points should be located throughout the POTW's service area and include all typical wastestreams from sources to which the POTW does **not** intend to apply local limits. Therefore, commercial users (such as photo processors, dentists, dry cleaners, restaurants, etc.) would be included in the background as long as the POTW does not intend to regulate these users through the local limits. If the POTW's service area includes areas served by different water companies, it is recommended that separate sampling be conducted in each of the drinking water service areas since the pollutant levels may vary based on different water sources of chemical addition. The background data is used, once the maximum allowable headworks loading (MAHL) is calculated, to come up with the unregulated loading which is then subtracted from the MAHL to result in a total allowable industrial loading. Because the unregulated flow is generally the majority of the flow to the POTW, accurate background levels are important when calculating the local limits.

Unless hauled waste is regulated through the local limits, it would be considered an unregulated waste. As with the background/domestic waste, the hauled waste loading is subtracted from the MAHL. Although the flow of hauled waste is often low compared to the overall flow or the background/domestic flow, the concentration of pollutants in the hauled waste can be very high, resulting in significant loadings that must be accounted for in the local limits

development. If the local limits are applied to the hauled waste, then the hauled waste loading is not subtracted from the MAHL, but the hauled waste flow is added to the industrial flow, and specific sampling data for the hauled waste is less important in the calculations.

3. Number and Type of Sampling Events

To receive statistically valid results, 20-30 sampling events per parameter per sampling point are recommended. If cost is an issue, then influent, effluent, domestic/unregulated, and hauled waste sample points should be stressed. Samples should be 24-hour flow proportioned composites if possible, except for those parameters which require grabs (e.g., cyanide, hexavalent chromium, volatile organics, total phenols, etc.). Where grab samples are necessary, a series of grabs samples over the course of a 24-hour period are recommended. Existing sampling data, such as results from NPDES permit-required influent/effluent monitoring, should be used in the evaluation, so long as it is technically valid and representative of current plant conditions. Note that quarterly sampling over the 5-year life of the NPDES permit would result in 20 samples.

4. Analytical Methods/Detection Levels

Regardless of cost, the lowest detection levels available should be used, unless the POTW knows that an analytical method with a higher detection level will consistently yield results that are not non-detectable. Data that shows non-detectable levels with a high detection limit will result in a large amount of sampling data that is of limited or no use. Sampling and analysis must be done in accordance with 40 CFR 136.

Sampling Plan Checklist -

	Y/N
List of Pollutants to be Evaluated	
• Standard 15 pollutants? ¹	
• Existing local limit pollutants?	
• Toxic pollutants listed in the NPDES permit?	
• Toxic pollutants listed in other disposal requirements (sludge, air, etc.)	
• Other pollutants identified in priority pollutant scans?	
• Other pollutants identified in an applicable TMDL or 303(d) listing?	
• If no to any of the above, is appropriate justification provided?	
Appropriate Sampling Points	
• Influent (prior to any recycle stream)?	
• Effluent?	
• Background (including unregulated commercial and industrial)?	
• Digester influent (for non-conservative pollutants w/inhibition criteria)?	
• Internal points (influent to treatment units with inhibition criteria)?	
• Hauled waste?	
Number of Samples	
• Use of existing data?	
• More than 10 sample events?	
Sample Type	
• Grab for required pollutants ² ?	
• 24-hour composite for all others?	
Analytical Methods	
• Use of EPA approved methods?	
• Use of most sensitive methods?	

¹Arsenic, cadmium, chromium, copper, cyanide, lead, mercury, molybdenum, nickel, selenium, silver, zinc, BOD, TSS, and ammonia

²Cyanide, hexavalent chromium, total phenols, volatile organics, oil & grease, sulfide